

3-D Land Use and Downtown Parking: Creating a Parking Demand Index

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Downtown Laramie parking is a limited commodity and the demand for on-street parking is a function of land use. This study examined land use in 3-D space and its demand on individual parking spaces using a demand bubble. Three different types of geo-referenced data were collected: land use on every floor of every building in the Downtown Laramie district; the location and type of parking spaces in the Downtown Laramie district; and, a random survey questionnaire of parking use and destinations. Thirty-six different land uses were recorded in the 506 activity spaces in Downtown Laramie. Overall, there are 829 on-street parking spaces varying from 15 minute to unlimited parking times. From survey data parking patrons average 37.5m to their first destination after parking and a 2.1hr average parking time. A parking catchment bubble can be created using the average distance as the bubble radii. By combining the three data sets, the total demand for each parking space can be calculated based on parking space position, adjacent land uses and the parking patron profile. A demand model for parking requirements by land use was created using the FHWA parking standards. Using the demand model, an index of parking demand was calculated for each parking space based on the 3-D land use. The patterns created provide a different perspective than the traditional land use parking demand without taking into consideration adjacent land uses and their demands for parking. Parking policy options were created based on the new parking demand index.

Key Words: 3-D land use, parking, demand model